N
V. 26, 1940
Physics Library

Physics
Dept
Purdue U.

CONTENTS

MATHEMATICS

		Page
Concerning the Open Subsets of a Plane Continuum	*By R. L. Moore*	24
On Homotopy and Extension of Mappings	*By R. H. Fox*	26
Integration and Differentiation in Partially Ordered Spaces	*By S. Bochner*	29
Normal Algebraic Number Fields	*By S. MacLane and O. F. G. Schilling*	122
On an Ergodic Analysis of the Remainder Term of Mean Motions	*By A. Wintner*	126
Groups Which Contain Less Than Fourteen Proper Subgroups	*By G. A. Miller*	129
On the Decomposition of Transitive Permutation Groups Generated by the Symmetric Group	*By J. S. Frame*	132
General Expansion Theorems	*By R. P. Boas, Jr.*	139
Some Combinatorial Properties of Complexes	*By H. Whitney*	143
On the Theory of Sphere-Bundles	*By H. Whitney*	148
A Decomposition of Compact Continua and Related Theorems on Fixed Sets under Continuous Transformations	*By J. L. Kelley*	192
Minimal Surfaces Spanning Closed Manifolds	*By R. Courant and N. Davids*	194
On Cauchy's Integral Theorem and on the Law of the Mean for Non-Derivable Functions	*By G. Fubini*	199
Recalculation and Extension of the Modulus and of the Logarithms of 2, 3, 5, 7 and 17	*By H. S. Uhler*	205
The Green's Function for a Differential System of Infinite Order	*By D. V. Widder*	213
Theorems in the Inverse Problem in the Calculus of Variations	*By J. Douglas*	215
A Set of Postulates for Bolyai-Lobatchevsky Geometry	*By F. P. Jenks*	277
A General Theory of Spectra. I	*By M. H. Stone*	280
The Groups Which Contain Exactly Fourteen Proper Subgroups	*By G. A. Miller*	283
Equilong Symmetry with Respect to Any Curve	*By E. Kasner*	287
Partially Ordered Sets and Topology	*By A. N. Milgram*	291
On the Distribution of Normal Point Groups	*By P. Erdős*	294
Abelian Groups Which Contain No More Than 25 Proper Subgroups	*By G. A. Miller*	350
On the Intersections of Irreducible Components in the Manifold of a Differential Polynomial	*By J. F. Ritt*	354
Differentials of Functions with Arguments and Values in Topological Abelian Groups	*By A. D. Michal*	356
Triangulated Manifolds Which Are Not Brouwer Manifolds	*By S. S. Cairns*	359
A Pathological Case in the Numerical Solution of Integral Equations	*By C. L. Pekeris*	433
The Conformal Theory of Curves	*By A. Fialkow*	437
Compound Multiplicative Diophantine Systems	*By E. T. Bell*	462
On Laguerre Series	*By R. E. Greenwood, Jr.*	466
Equilong and Conformal Transformations of Period Two	*By E. Kasner and J. De Cicco*	471
Surfaces of Minimal Capacity	*By G. C. Evans*	489

404982

THE POLYNOMIAL OF MITTAG-LEFFLER ..... *By H. Bateman* 491
BINARY FORMS ..... *By R. Oldenburger* 497
SUBGROUPS OF THE GROUPS WHOSE ORDERS ARE BELOW THIRTY ..... *By G. A. Miller* 500
A GENERAL THEOREM ON CONFORMAL MAPPING OF MULTIPLY CONNECTED DOMAINS ..... *By R. Courant, B. Manel and M. Shiffman* 503
ON HOMOTOPY GROUPS ..... *By S. Eilenberg* 563
ON AN INEQUALITY OF GRUNSKY ..... *By D. C. Spencer* 616
MINIMAL CROSS-CUT SUBGROUPS RELATIVE TO THE PRODUCT OF THEIR ORDERS .. *By G. A. Miller* 621
EVERY TWO EQUAL ORDER SUBGROUPS HAVING ONLY IDENTITY IN COMMON ..... *By G. A. Miller* 652
GENERALIZED HOMOLOGY GROUPS ..... *By W. Mayer and A. D. Campbell* 656
FUNCTIONS WHOSE EVEN DERIVATIVES HAVE A PRESCRIBED SIGN ..... *By D. V. Widder* 657
ON GREEN'S FORMULA ..... *By K. Menger* 660
SURFACES OF MINIMUM CAPACITY ..... *By G. C. Evans* 664
BOUNDARY VALUES OF FUNCTIONS SATISFYING A LINEAR PARTIAL DIFFERENTIAL EQUATION OF ELLIPTIC TYPE ..... *By S. Bergman* 668
A REMARK ON GENERAL FUCHSIAN GROUPS ..... *By G. Fubini* 695
THE DISTANCE IN GENERAL FUCHSIAN GEOMETRIES ..... *By G. Fubini* 700
ABSTRACT DEFINITE BOUNDARY VALUE PROBLEMS ..... *By J. W. Calkin* 708
UNSTABLE MINIMAL SURFACES OF HIGHER TOPOLOGICAL TYPES ..... *By M. Morse and C. B. Tompkins* 713

ASTRONOMY

GALACTIC AND EXTRAGALACTIC STUDIES, III. PHOTOGRAPHS OF THIRTY SOUTHERN NEBULAE AND CLUSTERS ..... *By H. Shapley and J. S. Paraskevopoulos* 31
ON THE DETERMINATION OF THE ORBITAL ELEMENTS OF ECCENTRIC ECLIPSING BINARIES ..... *By T. E. Sterne* 36
GALACTIC AND EXTRAGALACTIC STUDIES, IV. PHOTOMETRY OF TWO LARGE SOUTHERN CLUSTERS OF GALAXIES ..... *By H. Shapley and C. D. Boyd* 41
THE DOPPLER EFFECT IN RESONANCE LINES ..... *By L. G. Henyey* 50
GALACTIC AND EXTRAGALACTIC STUDIES, V. THE PERIOD FREQUENCY OF CLASSICAL CEPHEIDS IN THE MAGELLANIC CLOUDS ..... *By H. Shapley and V. McKibben* 105
REMARKS ON ZWICKY'S PAPER "ON THE FORMATION OF CLUSTERS OF NEBULAE AND THE COSMOLOGICAL TIME SCALE" ..... *By M. S. Vallarta* 116
THE OPACITY OF EXTENDED STELLAR ATMOSPHERES ..... *By O. Struve* 117
GALACTIC AND EXTRAGALACTIC STUDIES, VI. SUMMARY OF A PHOTOMETRIC SURVEY OF 35,000 GALAXIES IN HIGH SOUTHERN LATITUDES ..... *By H. Shapley* 166
THE ABSOLUTE MAGNITUDES OF STARS OF HIGH LUMINOSITY *By J. L. Greenstein* 259
SYNTHETIC SPECTRA FOR SUPERNOVAE ..... *By C. Payne-Gaposchkin and F. L. Whipple* 264
GALACTIC AND EXTRAGALACTIC STUDIES, VII. MAGNITUDES OF FORTY CEPHEIDS IN THE LARGE MAGELLANIC CLOUD ..... *By H. Shapley, V. McKibben and J. Mohr* 326
FURTHER REMARKS ON THE COSMOLOGICAL TIME SCALE ..... *By F. Zwicky* 332
ON POSSIBLE CHANGES IN THE SOLAR "CONSTANT" ..... *By T. E. Sterne, K. F. Guthe and W. O. Roberts* 399

ON SOLAR FACULAE AND SOLAR CONSTANT VARIATIONS.....By H. Artowski 406
HD 167362, AN OBJECT SIMILAR TO CAMPBELL'S HYDROGEN ENVELOPE STAR....
By P. Swings and O. Struve 454
THE SPECTRUM OF RW HYDRAE.....By P. Swings and O. Struve 458
A NOTE ON THE VARIATION OF DELTA SCUTI.....By T. E. Sterne 537
GALACTIC AND EXTRAGALACTIC STUDIES, VIII. A NEW DETERMINATION OF THE PERIOD-LUMINOSITY CURVE.....By H. Shapley 541
THE SPECTRUM OF BD +30°3639.....By P. Swings and O. Struve 548
GALACTIC AND EXTRAGALACTIC STUDIES, IX. A PHOTOMETRIC SURVEY OF 22,000 GALAXIES IN THE ZONE FROM $\delta = +41°$ TO $\delta = +46°$.....
By H. Shapley and R. B. Jones 554
GALACTIC AND EXTRAGALACTIC STUDIES, X. NOTE ON LATITUDE EFFECT AND RADIAL GRADIENTS IN THE NORTHERN GALACTIC HEMISPHERE.....
By H. Shapley and R. B. Jones 599
GALACTIC AND EXTRAGALACTIC STUDIES, XI. NOTE ON THE PERIOD-FREQUENCY OF GALACTIC CEPHEIDS.....By H. Shapley 681

PHYSICS

NOTE ON THE PROBLEM OF THE DISTRIBUTION OF STRESS IN A THIN STIFFENED ELASTIC SHEET.....By E. Reissner 300
ON SOME PERIODIC PROPERTIES OF THE SYSTEM OF ISOTOPES.....By A. E. Haas 305
MECHANISM OF LONG WAVE-LENGTH ABSORPTION OF THE CARBONYL GROUP.....
By H. L. McMurry and R. S. Mulliken 312
THE CORONAVISER, AN INSTRUMENT FOR OBSERVING THE SOLAR CORONA IN FULL SUNLIGHT.....By A. M. Skellett 430
ON A GENERAL RULE CONCERNING THE HALF-VALUE PERIODS OF ELECTRON-EMITTING NUCLEI.....By A. E. Haas 565
THE EFFECT OF SHEAR INSTABILITY ON THE TRANSVERSE CIRCULATION IN THE ATMOSPHERE.....By H. J. Stewart 604
THE CORRECTION OF X-RAY DIFFRACTION INTENSITIES FOR LORENTZ AND POLARIZATION FACTORS.....By M. J. Buerger 637

CHEMISTRY

STUDIES IN CALCIUM METABOLISM WITH THE AID OF ITS INDUCED RADIOACTIVE ISOTOPE. I.....By W. W. Campbell and D. M. Greenberg 176
MICELLE FORMATION IN AQUEOUS SOLUTIONS OF DIGITONIN.....
By E. L. Smith and E. C. Pickels 272
THE COURSE OF THIAMIN METABOLISM IN MAN AS INDICATED BY THE USE OF RADIOACTIVE SULFUR.....
By H. Borsook, E. R. Buchman, J. B. Hatcher, D. M. Yost and E. McMillan 412
RADIOACTIVE CARBON IN THE STUDY OF RESPIRATION IN HETEROTROPHIC SYSTEMS.
By S. Ruben and M. D. Kamen 418
CO_2 ASSIMILATION BY PROPRIONIC ACID BACTERIA STUDIED BY THE USE OF RADIOACTIVE CARBON.....By S. F. Carson and S. Ruben 422
THE REDUCTION OF RADIOACTIVE CARBON DIOXIDE BY METHANE-PRODUCING BACTERIA.....By H. A. Barker, S. Ruben and M. D. Kamen 426
STUDIES IN MINERAL METABOLISM WITH THE AID OF INDUCED RADIOACTIVE ISOTOPES. IV—MANGANESE.....By D. M. Greenberg and W. W. Campbell 448

404982

RADIOACTIVE CARBON AS AN INDICATOR OF CARBON DIOXIDE REDUCTION. IV. THE SYNTHESIS OF ACETIC ACID FROM CARBON DIOXIDE BY CLOSTRIDIUM ACIDI-URICI.....*By H. A. Barker, S. Ruben and J. V. Beck* 477
A COMPARISON OF THE METABOLISM OF IODINE AND OF ELEMENT 85 (EKA-IODINE). *By J. G. Hamilton and M. H. Soley* 483
RIBONUCLEIC ACIDS IN BOTH NUCLEUS AND CYTOPLASM, AND THE FUNCTION OF THE NUCLEOLUS.....*By T. Caspersson and J. Schultz* 507
INHIBITION OF CARBOXYLASE BY THIAZOLE PYROPHOSPHATE..... *By E. R. Buchman, E. Heegaard and J. Bonner* 561

BOTANY

THE NATURE OF ABSORPTION OF RADIOACTIVE ISOTOPES BY LIVING TISSUES AS ILLUSTRATED BY EXPERIMENTS WITH BARLEY PLANTS..... *By R. Overstreet and T. C. Broyer* 16
CYTOPLASMIC BEHAVIOR DURING DIVISION OF VACUOLATE PLANT CELLS..... *By E. W. Sinnott and R. Bloch* 223
MUTATIONS AND REVERSIONS IN REPRODUCTIVITY OF ASPERGILLI WITH NITRITE, COLCHICINE AND *d*-LYSINE.....*By R. A. Steinberg and C. Thom* 363
TRAUMATIC ACID AND THIAMIN AS GROWTH FACTORS FOR ALGAE..... *By J. van Overbeek* 441
SOME TRABECULATE CODIUMS (INCLUDING TWO NEW SPECIES)..*By W. A. Setchell* 443
SYNTHESIS OF THIAMIN BY EXCISED ROOTS OF MAIZE.....*By J. E. McClary* 581
FUCUS CORDATUS TURNER.....*By W. A. Setchell* 643
THE ABSORPTION OF BICARBONATE ION BY BARLEY PLANTS AS INDICATED BY STUDIES WITH RADIOACTIVE CARBON..... *By R. Overstreet, S. Ruben and T. C. Broyer* 688

ZOÖLOGY AND ANATOMY

PHYSIOLOGY OF DEVELOPMENT OF THE FEATHER. IV. THE DIURNAL CURVE OF GROWTH IN BROWN LEGHORN FOWL.....*By F. R. Lillie and H. Wang* 67
THE PIGMENT-FORMING POTENCY OF EARLY CHICK BLASTODERMS..... *By M. E. Rawles* 86
ON THE SYNTHESIS OF CLEAVAGE CHROMOSOMES.....*By T. S. Painter* 95
THE EXPERIMENTAL PRODUCTION OF MELANIN PIGMENT ON THE LOWER SURFACE OF SUMMER FLOUNDERS (PARALICHTHYS DENTATUS).....*By C. M. Osborn* 155
A RESPIRATORY PIGMENT FROM THE EGGS OF A MARINE WORM..... *By N. H. Horowitz* 161
NOVEL TYPES OF NERVE REFLEXES.....*By G. H. Parker* 246
AGGLUTINATION OF SEA-URCHIN EGGS BY MEANS OF A SUBSTANCE EXTRACTED FROM THE EGGS.....*By A. Tyler* 249
DIURNAL VARIATION OF INTERMEDIN IN THE BLOOD OF THE ALBINO RAT..... *By L. Levinson* 257
THE INFLUENCE OF NERVE FIBERS UPON TASTE BUDS DURING EMBRYONIC DEVELOPMENT.....*By T. W. Torrey* 627
THE DEVELOPMENT OF MELANOPHORES FROM EMBRYONIC MOUSE TISSUES GROWN IN THE COELOM OF CHICK EMBRYOS.....*By M. E. Rawles* 673

GENETICS

ANALYSIS OF VARIANCE APPLIED TO HUMAN GENETICS.....*By C. B. Davenport* 1
TWO X-RAY INDUCED MOSAICS IN DROSOPHILA PSEUDOÖBSCURA..*By R. G. Helfer* 3
THE SIZE OF THE TOBACCO MOSAIC PARTICLE FROM X-RAY DETERMINATIONS....
By J. W. Gowen 8
A NEW INHERITED CHARACTER IN MAN.....*By A. H. Sturtevant* 100
INFLUENCE OF FEMALE STOCK ON THE FUNCTIONING OF SMALL POLLEN MALE GAMETES.....*By W. R. Singleton* 102
FURTHER OBSERVATIONS ON THE MECHANISM OF INDUCED CHROMOSOME REARRANGEMENT IN SCIARA.....*By C. W. Metz and M. L. Bozeman* 228
CONJUGATION OF THREE ANIMALS IN PARAMECIUM BURSARIA.....*By T. T. Chen* 231
POLYPLOIDY IN PARAMECIUM BURSARIA.....*By T. T. Chen* 239
EVIDENCES OF EXCHANGE OF PRONUCLEI DURING CONJUGATION IN PARAMECIUM BURSARIA.....*By T. T. Chen* 241
CONJUGATION IN PARAMECIUM BURSARIA BETWEEN ANIMALS WITH VERY DIFFERENT CHROMOSOME NUMBERS AND BETWEEN ANIMALS WITH AND WITHOUT MICRONUCLEI.....*By T. T. Chen* 243
EFFECTS OF CERTAIN CHEMICAL TREATMENTS ON THE MORPHOLOGY OF SALIVARY GLAND CHROMOSOMES AND THEIR INTERPRETATION.....
By M. Calvin, M. Kodani and R. Goldschmidt 340
A COMPARISON OF CHROMOSOMAL ABERRATIONS INDUCED BY X-RAY AND ULTRAVIOLET RADIATION.....*By C. P. Swanson* 366
CYTOLOGY AND DEVELOPMENT OF THE EMBRYOS OF X-RAYED ADULT DROSOPHILA MELANOGASTER.....*By B. P. Sonnenblick* 373
TOUCH-AND-GO PAIRING IN CHROMOSOMES.....*By F. Schrader* 634

PHYSIOLOGY AND BIOCHEMISTRY

THE THEORY OF THE VISUAL THRESHOLD. I. TIME AND INTENSITY.....
By W. J. Crozier 54
TEMPERATURE AND THE CRITICAL INTENSITY FOR RESPONSE TO VISUAL FLICKER. IV. ON THE INVARIANCE OF CRITICAL THERMAL INCREMENTS, AND THE THEORY OF THE RESPONSE CONTOUR.....*By W. J. Crozier and E. Wolf* 60
ON SPINAL SHOCK.....*By A. van Harreveld* 65
FURTHER STUDIES ON THE PARTHENOGENETIC ACTIVATION OF RABBIT EGGS.....
By G. Pincus and H. Shapiro 163
THE THEORY OF THE VISUAL THRESHOLD. II. ON THE KINETICS OF ADAPTATION.....*By W. J. Crozier* 334
ON THE LAW FOR MINIMAL DISCRIMINATION OF INTENSITIES. IV. ΔI AS A FUNCTION OF INTENSITY.....*By W. J. Crozier* 382
DIFFERENCES BETWEEN MEN AND WOMEN IN THEIR RESPONSE TO HEAT AND COLD.....*By J. D. Hardy and E. F. Du Bois* 389
SOME *in vivo* EFFECTS OF LOCALIZED NUCLEAR DISINTEGRATION PRODUCTS ON A TRANSPLANTABLE MOUSE SARCOMA.....
By P. A. Zahl, F. S. Cooper and J. R. Dunning 589

PATHOLOGY AND BACTERIOLOGY

SOME BIOLOGICAL EFFECTS OF NUCLEAR DISINTEGRATION PRODUCTS ON NEOPLASTIC TISSUE.....*By P. G. Kruger* 181

ANTHROPOLOGY AND PSYCHOLOGY

"PERSONALITY" DIFFERENCES AS DESCRIBED BY INVARIANT PROPERTIES OF INDIVIDUALS IN INTERACTION ..... *By E. D. Chapple* 10
THE EFFECT OF AN "EMOTIONAL STATE" ON THE INITIAL STAGES OF ACQUISITION IN A CONDITIONED OPERANT RESPONSE ..... *By R. M. Gagné and C. H. Graham* 297
SIMULTANEOUS MEASURES OF HUMAN RELATIONS AND EMOTIONAL ACTIVITY ..... *By E. D. Chapple and C. F. Harding, III* 319
ON THE MORTALITY IN HUSBANDS AND WIVES ..... *By A. Ciocco* 610